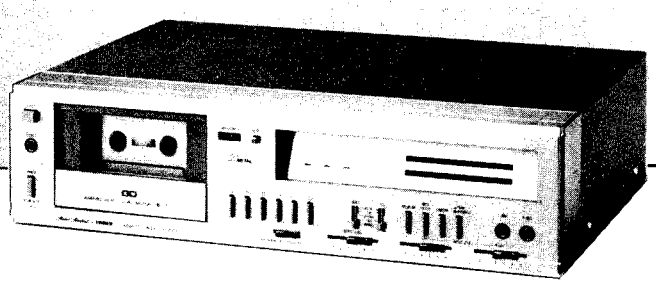
SERVICE MANUAL

FISHER

CR9000

CASSETTE RECORDER



THE FIRST NAME IN HIGH FIDELITY

SPECIFICATIONS

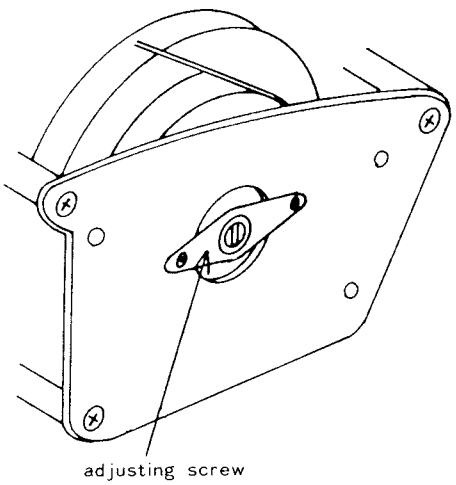
Wow + Flutter Record/Playback-DIN Weighted (2σ)	±0.15%
Speed Accuracy	±0.8%
Rewinding Speed (C-60)	100 sec.
Frequency Response (7 dB Window)	
NORMAL	30Hz-15kHz
$FeCr/CrO_2$	30Hz-17kHz
METAL	30Hz-20kHz
Dolby NR System	Yes
S/N Ratio with Dolby (DIN-A Weighted)	
NORMAL	60 dB
$FeCr/CrO_2$	63 dB
METAL	63 dB
Crosstalk Stereo	40 dB
Erasing Effect	70 dB

T. H. D.	
NORMAL	1.5%
CrO_2	2.2%
Metal	1.2%
Heads	2 Heads R/P Head..... Sendust Erase Head... Ferrite
Electric Operation Control	2 Motor Capstan Drive..... DC Servo Reel Drive..... DC Governor
Auto Stop System	Full Auto Stop at Tape End
Dimensions (including Feet, excluding knobs)	(W) 440 × (H) 109 × (D) 300 mm
Power Supply	AC 120/220V (Internal selection), 50/60Hz
Accessories	2 patch cord with RCA plugs

MECHANICAL ADJUSTMENT

FLYWHEEL SUPPORT ADJUSTMENT

Adjust the clearance between flywheel and flywheel mounting to 0.05~0.2 mm (by means of manual sense) by turning the adjusting screw.



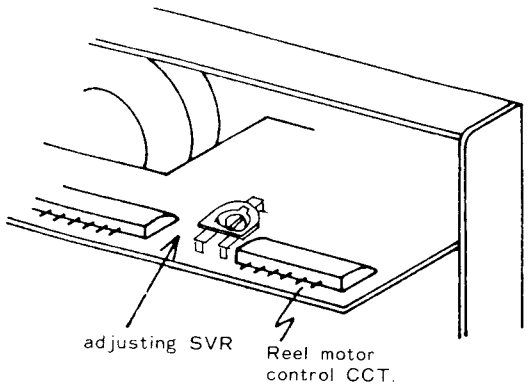
PINCH ROLLER ADJUSTMENT

is not necessary.

ELECTRICAL ADJUSTMENT

ADJUSTMENT OF REEL-MOTOR TORQUE AND BACK TENSION TORQUE

1. Play back the torque measurement tape 811/CTM PHILIPS.
2. Adjust the SVR in governor circuit, located behind the cassette mechanism, for a scale reading of 55 gr/cm on the torque measurement tape.



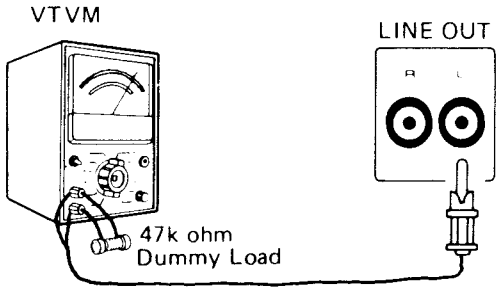
3. Play back torque measurement tape W-100M (by Silver shoji). Scale reading should be 4 gr/cm and 14 gr/cm.

HEAD AZIMUTH ADJUSTMENT

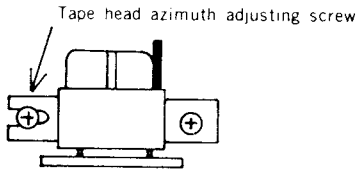
Instrument : VTVM, TEAC test tape MTT-114.

1. Connect a VTVM to the left LINE OUT terminal.

ELECTRICAL ADJUSTMENT



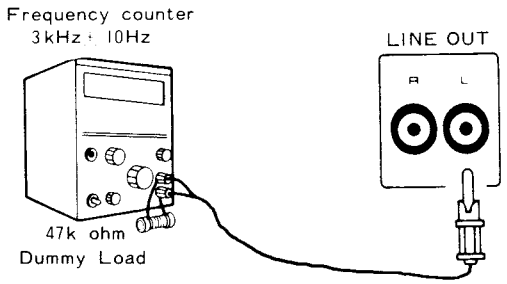
2. Play back the test tape MTT-114 or an equivalent test tape which contains the signal for AZIMUTH ADJUSTMENT.
3. Adjust R/P head angle adjusting screw for maximum output level reading on the VTVM.
4. Then connect the VTVM to the right LINE OUT terminal and fine adjust the screw.
5. Repeat the adjustment several times until both channels have equal output amplitude.
   Then secure the adjusting screw with lacquer.



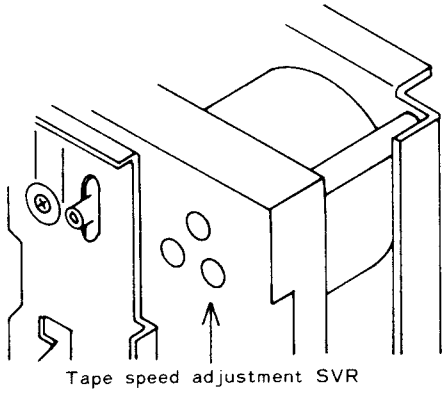
TAPE SPEED ADJUSTMENT

Instrument : frequency counter, 3KHz test tape.

1. Connect a frequency counter to the left or right channel LINE OUT and play back a 3KHz test tape (Example : TEAC MTT-111).



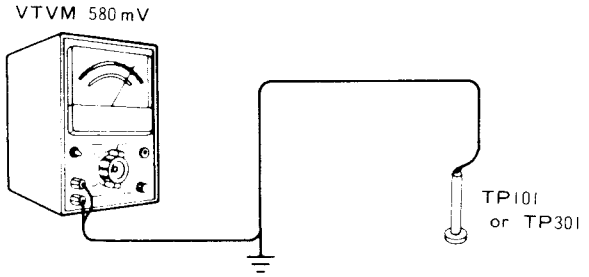
2. Adjust the tape speed by turning the SVR in the motor as illustrated to obtain 3,000Hz± 10Hz on the frequency counter.



PLAYBACK GAIN ADJUSTMENT AND LEVEL METER ADJUSTMENT

Instrument : VTVM, test tape MTT-150

1. Connect a VTVM to TP-101 and TP-301 alternately.
2. Set the DOLBY NR, MPX FILTER and LIMITER switches to OFF.
3. Play back test tape MTT-150 (DOLBY LEVEL CALIBRATION TAPE).
4. Adjust SVR101, SVR301 for a VTVM reading of 580 mV respectively for the left and right channels.

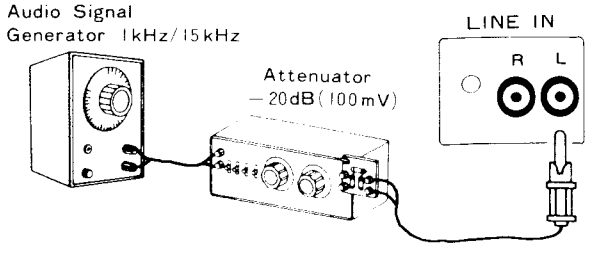


5. Then, adjust SVR104 and SVR304 for left and right LED METER readings of 0 dB at peak mode.

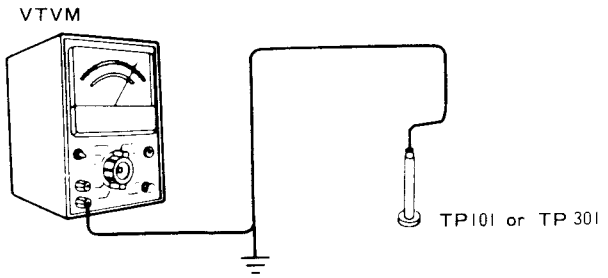
BIAS ADJUSTMENT

Instrument : VTVM, audio signal generator, attenuator, blank tape (TDK-SA, TDK-AD, TDK METAL, SONY DUAD)

1. Set the DOLBY NR, MPX FILTER and LIMITER switches to OFF.
2. Connect a VTVM to TP101 and TP301, and connect an audio signal generator and an attenuator to the LINE IN jack.



ELECTRICAL ADJUSTMENT——DESCRIPTION OF CONTROL IC1-



3. Locate the blank tape (TDA-SA).
4. Set the unit in the record mode and set EQ and BIAS select switches to CrO_2, and set the signal level to — 25 VU.
5. Adjust SVR105 (305) for a flat frequency response (15kHz/1kHz at — 25VU).
6. Locate the blank tape (TDK-AD).
7. Set the unit in the record mode and set EQ and BIAS select switches to normal.
8. Adjust SVR106 for a flat frequency response (15kHz/1kHz).
9. Adjust SVR107 for a flat frequency response (15kHz/1kHz). (TDK METAL TAPE, METAL tape position)

RECORDING GAIN ADJUSTMENT

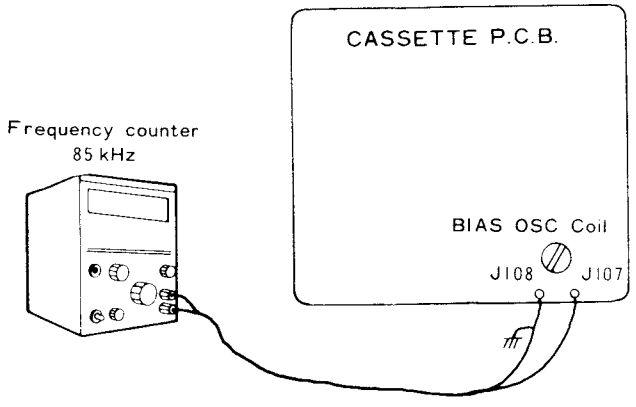
(After Bias Adjustment)

1. Set EQ and Bias Select SW to CrO_2 (using TDK-SA)
2. Connect a VTVM to TP101 and TP301, and connect an audio signal generator and an attenuator to the LINE IN jack.
3. Set the VR to get —7.5dB (from 580mV) at TP101 and TP301.
4. Adjust SVR102, 302 for equal signal level in the record mode.
5. After adjusting at CRO_4 mode, adjust SVR103,303 at METAL mode (using TDK METAL)

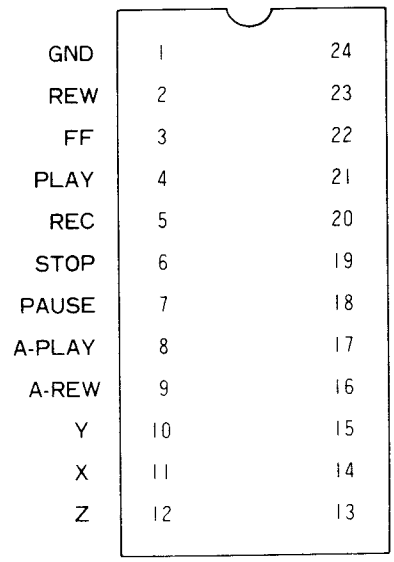
RECORDING BIAS FREQUENCY ADJUSTMENT

Instrument : Frequency counter

1. Connect a frequency counter to J107, J108.
2. Set the unit in the record mode.
3. Adjust record bias oscillator coil for a counter reading of 85kHz.



(1). Pin Layout



(2). Pin Code

1	GND	
2	REW	Key Signal Input Pins
3	FF	
4	PLAY	
5	REC	
6	STOP	
7	PAUSE	
8	A・REW	Other Signal Input Pins
9	A・PLAY	
10	Y	
11	X	
12	Z	
13	OSC	
14	INH	Input Pin
15	O-PLAY	Output Pins
16	O-REC	
17	$\overline{\text{O-STOP}}$	
18	O-FF REW	
19	O-PAUSE	
20	$\overline{\text{O-MUT}}$	
21	O-REW	
22	O-FF	
23	TAPE END	
24	V_{DD}	

(3). Description about Input Pins of Key signal

Pin No.	Name	Description
2	REW	Signal to command rewinding of tape.
3	F. F	Signal to command fast winding
4	PLAY	Signal to command playback When Play signal is input with Rec signal simultaneously, recording starts.
5	REC	Signal to command recording - effective only in the case Play signal is input simultaneously.
6	STOP	Signal to command stopping.
7	PAUSE	Signal to command pause temporarily and/or starting again. - effective in the mode of Stop, Playback and Record.

(4). Description about Input Pin of other signal

Pin No.	Name	Description
8	A-REW	Signal to rewind the tape automatically when it stops at PLAY mode.
9	A-PLAY	Signal to playback the tape automatically when it stops at REWIND mode.
12	Z	Input Pin of detected signal that tape motion stopped.

(5). Description about Output Pins

Pin No.	Name	Description
15	O-PLAY	at playback and record modes, output level is high.
16	O-REC	at record and record/pause modes, output level is high.
17	$\overline{\text{O-STOP}}$	at each modes except stop, output level is high.
18	O-F.F REW	at F. F and rewind modes, output level is high.
19	O-PAUSE	at PAUSE mode, output level is high.
21	O-REW	at rewind mode, output level is high.
22	O-F. F	at F. F mode, output level is high.

(6). Status of each Output Pins with Key signals input ("O" marked position indicates output level is high.)

Key signal / Output Pin	STOP	F. F	REW	PLAY	REC/PLAY	PAUSE		
						STOP→	PLAY→	REC/PLAY→
O-PLAY				O	O			
O-REC					O			O
$\overline{\text{O-STOP}}$		O	O	O	O	O	O	O
O-F. F REW		O	O					
O-PAUSE						O	O	O
O-REW			O					
O-F. F		O						
MODE	Stop	F. F	Rew	Play	Record	Pause	Play/Pause	Record/Pause

(7). Description of OSC and INH Pins

Pin No.	Name	Description
13	OSC	Pin for connecting C, R that determine oscillation frequency of 1-Pin type oscillator Clock pulse generated in this oscillator is used for determination of timing inside IC and to prevent chattering.
14	$\overline{\text{INH}}$	At any modes If this pin is set in low level, output except from $\overline{\text{O-MUT}}$, TAPE END is cut off, and cassette mechanism stops.

OPERATION OF CONTROL CIRCUITS

(1). Play key is pressed, and then level of Pin 15 becomes high (5V).
(2). Positive (+) pulse is delivered to base of Q13 through Lock SW S4.
(3). When Q13 is switched ON, and Q14 is also switched ON. Current flows through the PULL-PLUNGER coil. Consequently the plunger pushes the slide-base upward to bring the head in tight contact with the tape. Simultaneously SW 4 which is interlocked with the slide base plate is switched, and C and B of SW 4 is connected.
(4). Then Q15 are switched ON, and current flows through the HOLD-PLUNGER coil to lock the slide base plate.
(5). Approximately 0.5 sec. later, the monostable multivibrator automatically restores the original state-Q13 is switched OFF, Q12 is switched ON and Q14 is switched OFF-and the PULL-PLUNGER is released and returns to rest. (The slide base is locked with the HOLD-PLUNGER.)
(6). D13 and D12 are OR Gates from F. FWD (Pin 22) and REW (Pin 21). When F. F or REW key is depressed, only the HOLD-PLUNGER operates.

MOTOR DRIVING CIRCUIT

1. Playback Operation
(1). Play key is depressed, and then level of Pin 15 becomes high (5V).
(2). Q11 is switched ON through OR Gate D8 to rotate the capstan motor.
(3). When Pin 15 becomes high level, Q4 is switched ON. Q6 is also switched ON through OR Gate D10 then terminal A of Reel Motor (M 2) is given high level (12.0V).
(4). Consequently Q9 which is biased by R21 from terminal A is switched ON.
(5). However Q10 is OFF, so current flows through D17 in governor circuit in the sequence of Q6, M2, Q9, D17.
(6). In the governor circuit current is devided, and the potential between C and B is kept constant by utilizing the character that the internal resistance in CONTROL TR changes according to the fluctuation of motor current. Consequently the fluctuation of torque and speed of the reel motor (M2) is hold down.

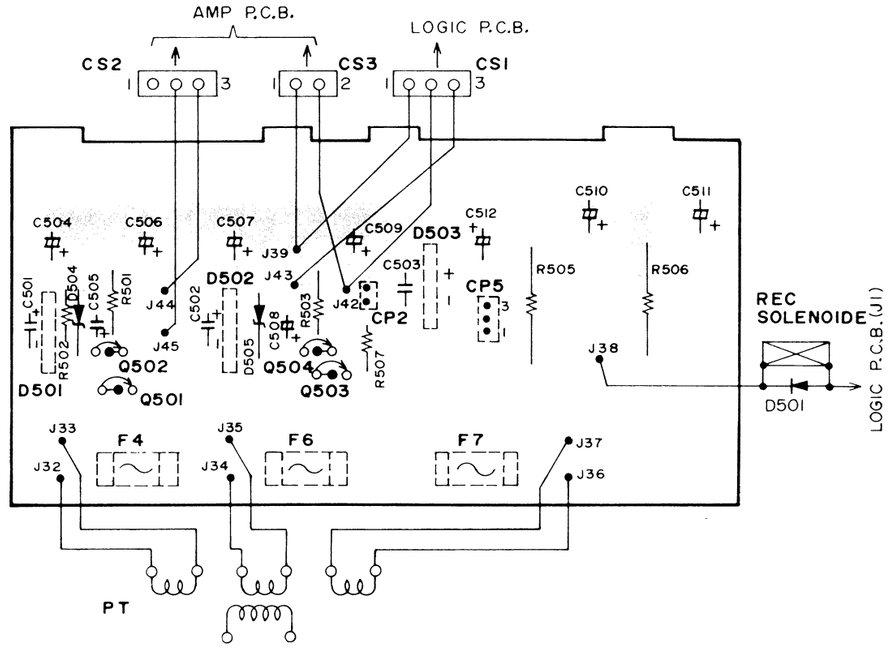
2. Rewind Operation
(1). Rewind key is pressed, and then levels of Pin 18 and 21 become high.
(2). Pin 15 and 19 are kept low level, so the capstan motor (M1) keep halting.
(3). When Pin 21 becomes high level, Q5 is switched ON, and Q7 and also Q8 are switched ON.
(4). When Pin 18 becomes high level, Q10 is switched ON.
(5). And the current flows in the sequence of Q7, M2, Q8 and Q10, then reel motor has potential of about 11V.

In this case the polar of motor is positive (+) at D, so the reel motor rotates in the opposite direction compared with playback and Fast Forward operation.

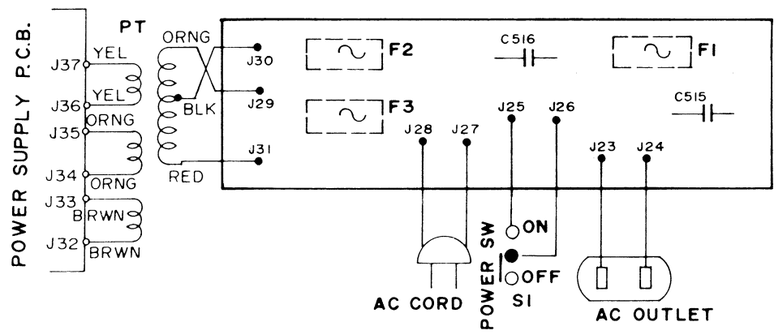
3. Pause Operation
(1). Pause key is pressed, and then level of Pin 15 becomes low.
However Pin 19 becomes high level and Q11 is switched ON, and then the capstan motor keeps rotating.

WIRING DIAGRAM

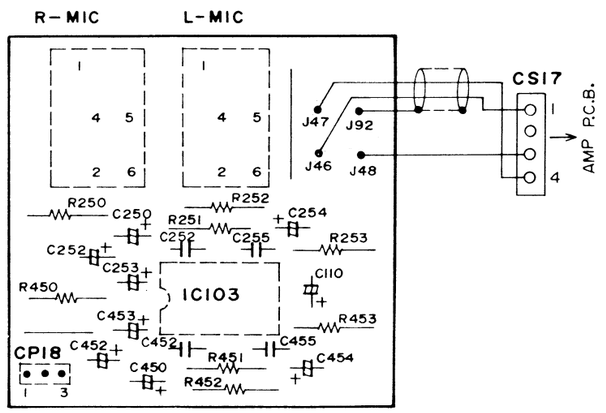
POWER SUPPLY P.C.B. Bottom



CONNECTOR P.C.B. Bottom

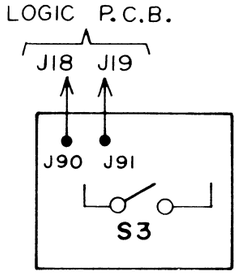


MIC P.C.B. Bottom

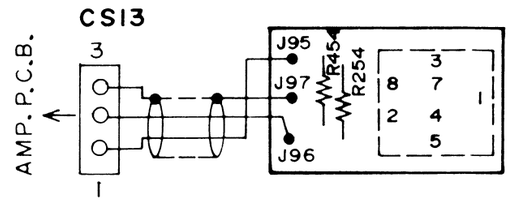


WIRING DIAGRAM

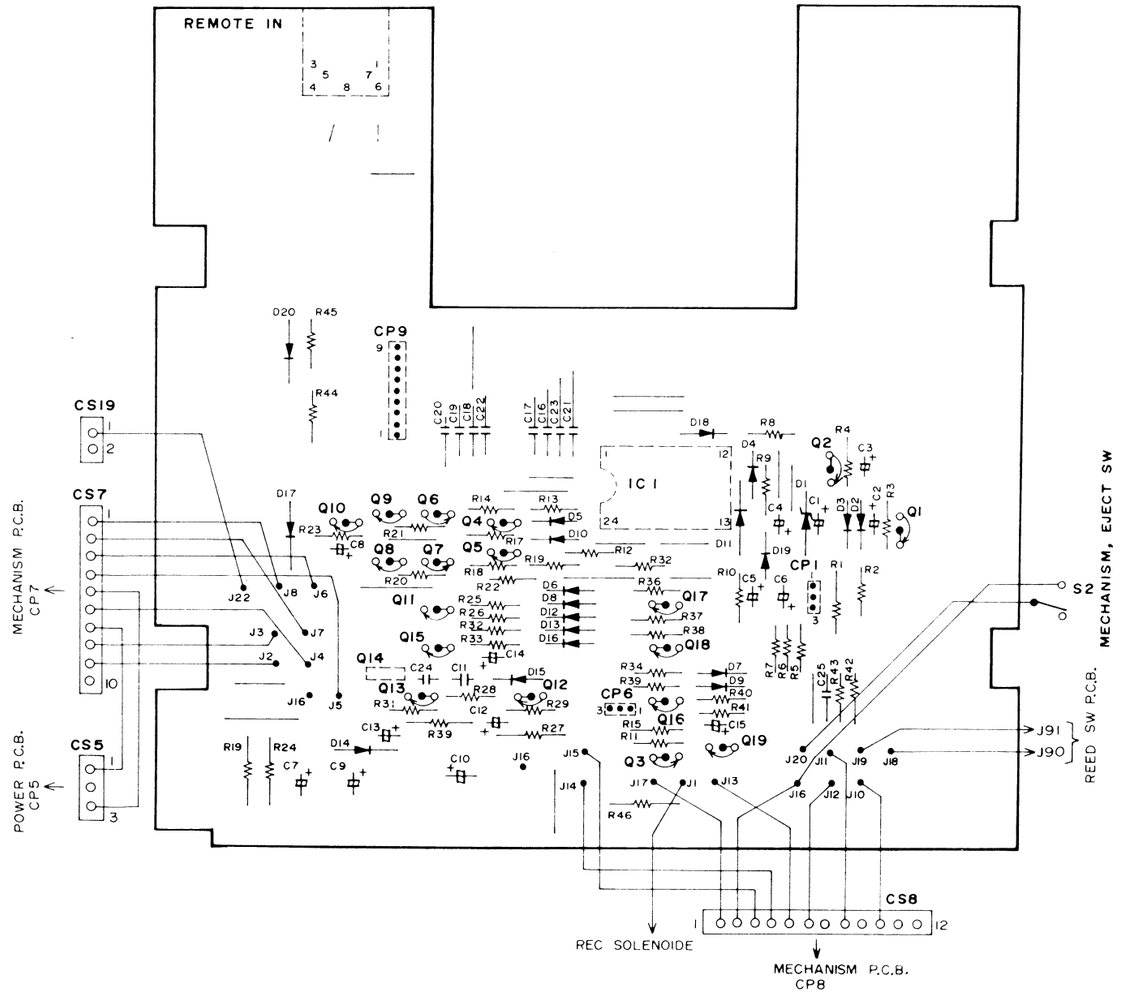
REED SW P.C.B. Bottom



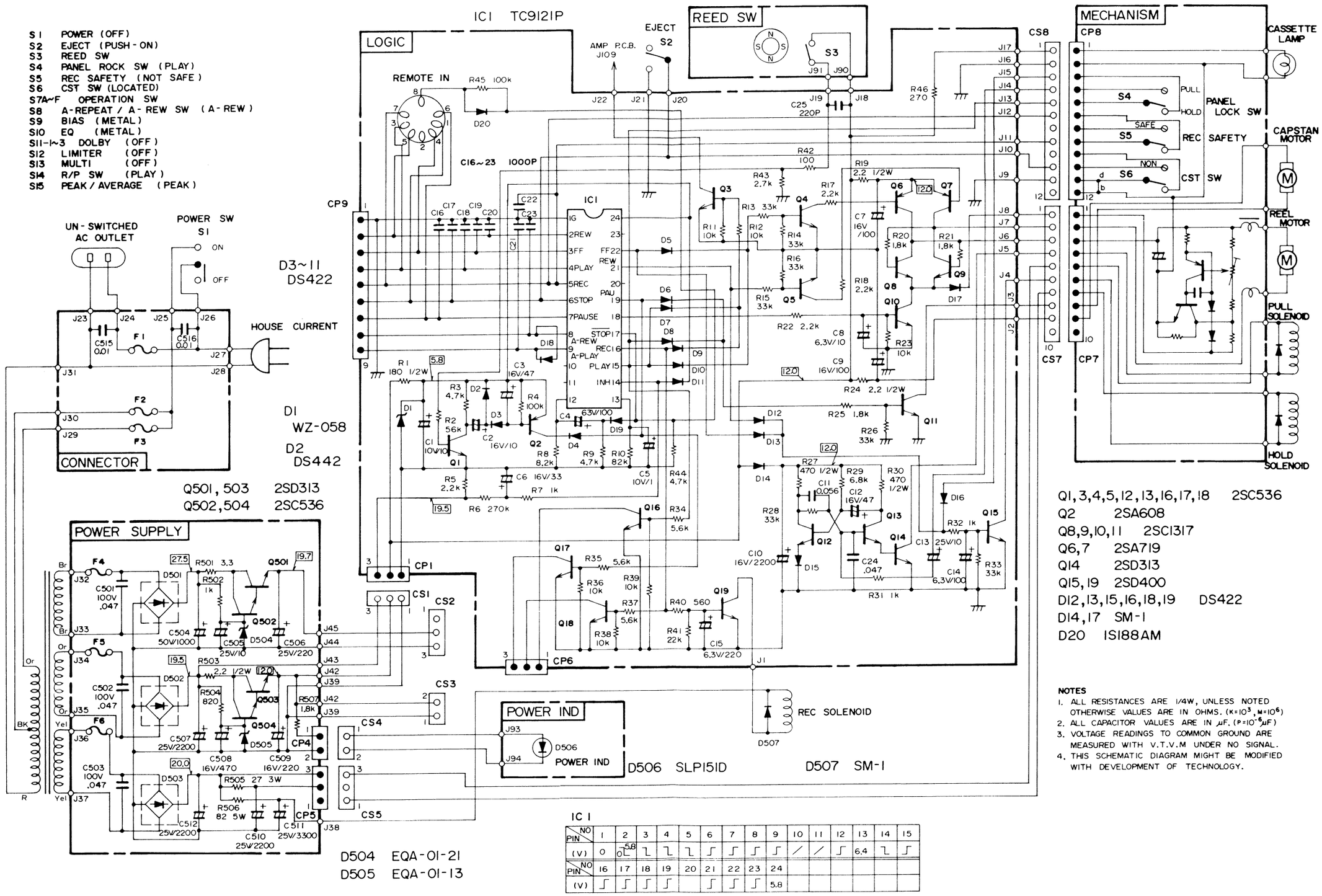
HEADPHONE P.C.B. Bottom



LOGIC P.C.B. Bottom



SCHEMATIC DIAGRAM



IC1

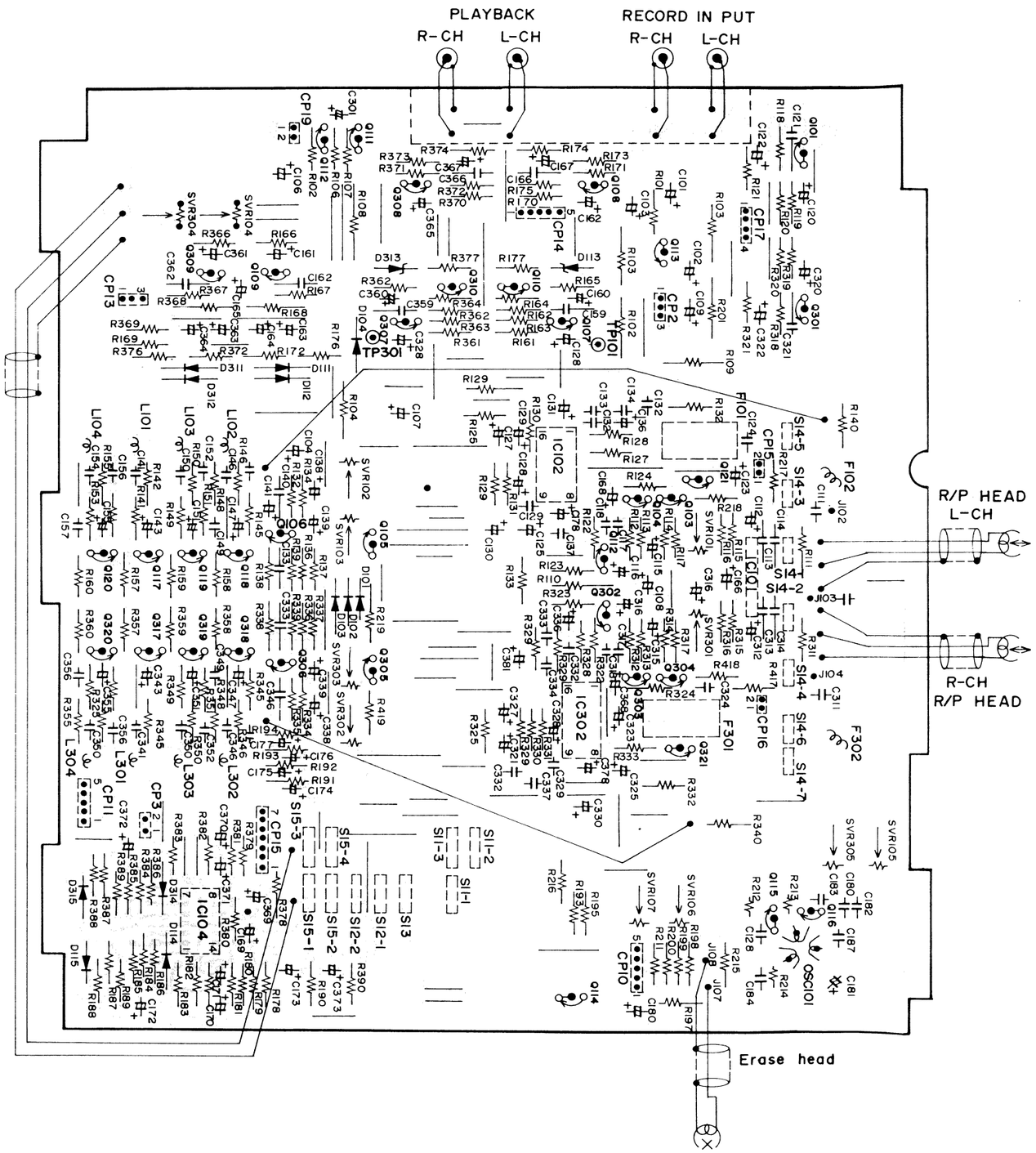
PIN NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
(V)	0	0	5.8										6.4		
PIN NO	16	17	18	19	20	21	22	23	24						
(V)									5.8						

NOTES

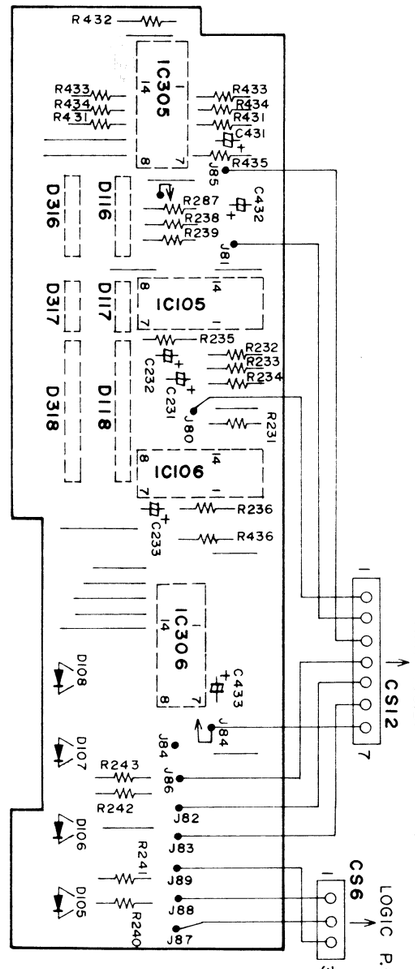
1. ALL RESISTANCES ARE 1/4W, UNLESS NOTED OTHERWISE VALUES ARE IN OHMS. (K=10^3, M=10^6)
2. ALL CAPACITOR VALUES ARE IN μF. (P=10^{-6}μF)
3. VOLTAGE READINGS TO COMMON GROUND ARE MEASURED WITH V.T.V.M UNDER NO SIGNAL.
4. THIS SCHEMATIC DIAGRAM MIGHT BE MODIFIED WITH DEVELOPMENT OF TECHNOLOGY.

WIRING DIAGRAM

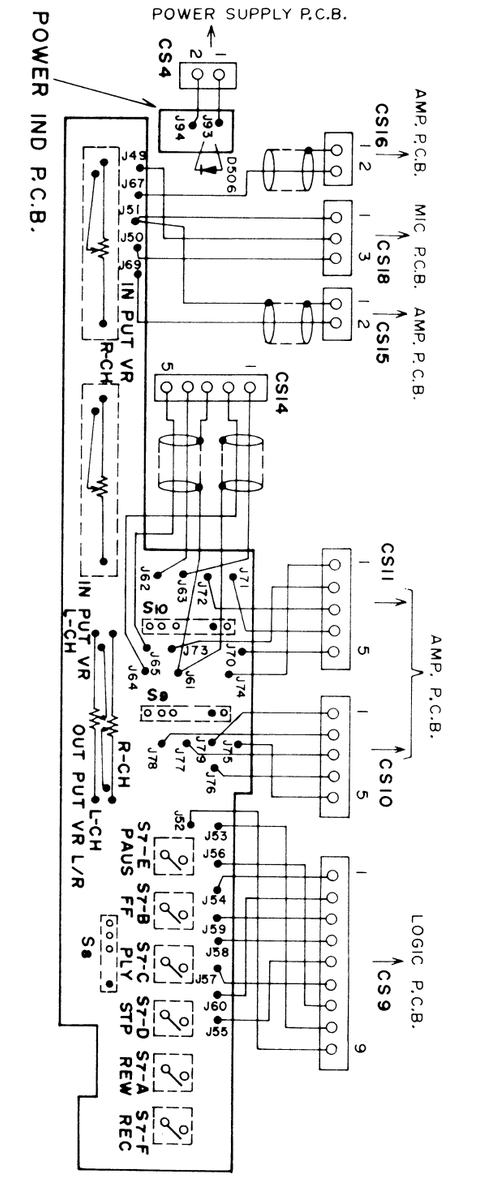
AMP P.C.B. Bottom



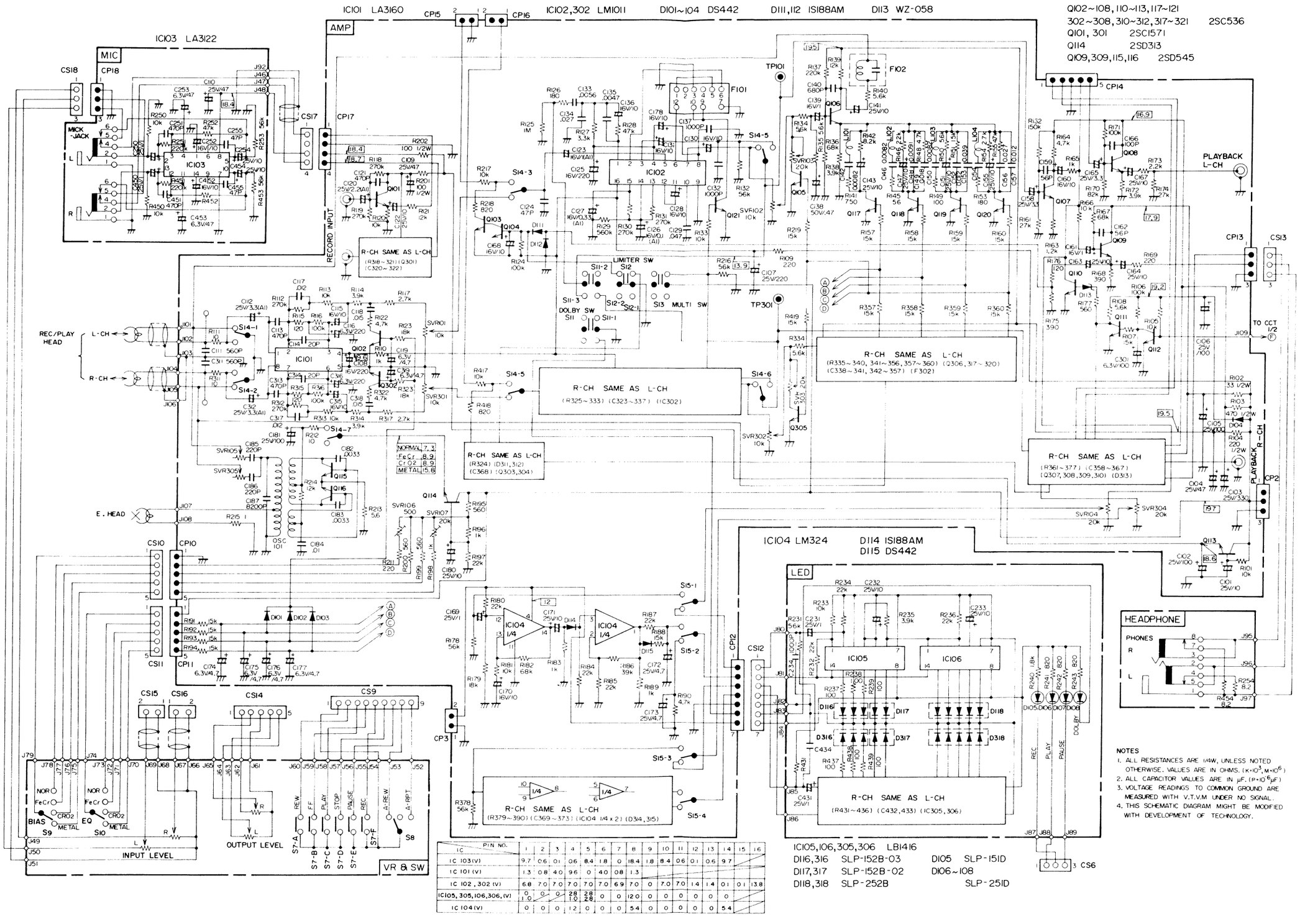
LED P.C.B. Bottom



VOLUME & SWITCH P.C.B. Bottom



SCHEMATIC DIAGRAM



PIN NO. / IC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC 103 (V)	9.7	0.6	0.1	0.6	8.4	1.8	0	18.4	1.8	8.4	0.6	0.1	0.6	9.7		
IC 101 (V)	1.3	0.8	4.0	9.6	0	4.0	0.8	1.3								
IC 102, 302 (V)	6.8	7.0	7.0	7.0	7.0	7.0	6.9	7.0	0	7.0	7.0	1.4	1.4	0.1	0.1	13.8
IC105, 305, 106, 306, (V)	0 / 1.0	0	0	2.8 / 1.0	2.8 / 2.8	0	0	12.0	0	0	0	0	0	0		
IC 104 (V)	0	0	0	1.2	0	0	0	5.4	0	0	0	0	0	5.4		

IC105,106,305,306 LB1416
D116,316 SLP-152B-03
D117,317 SLP-152B-02
D118,318 SLP-252B
D105 SLP-151D
D106~108 SLP-251D

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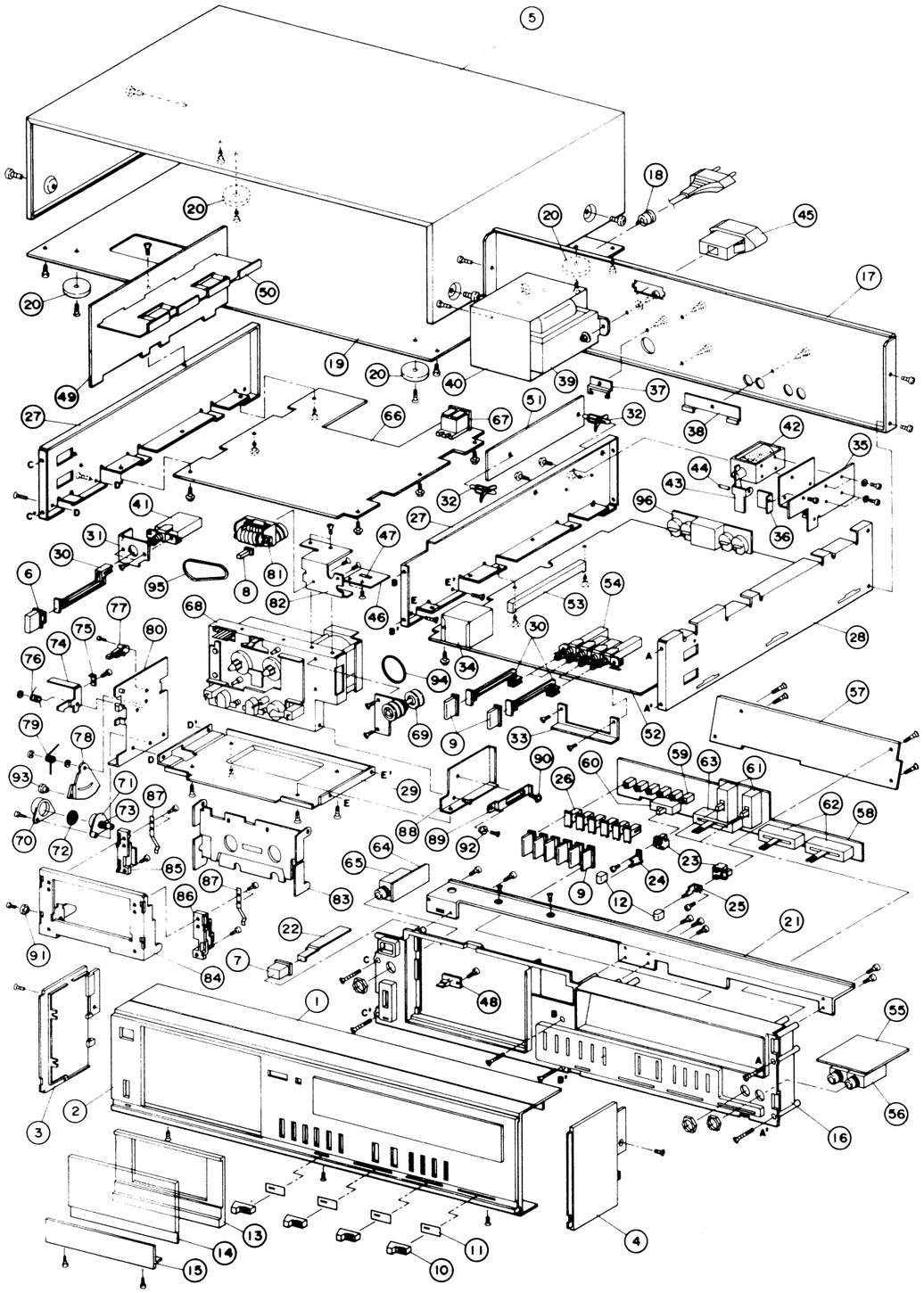
EXPLODED VIEW



PARTS LIST

Key No.	Ref. No.	Part No.	Description	Q'ty
PACKAGE PARTS				
		R-4770191	Caution label	1
			Polyethylene bag, 100x240, AC cord	1
		R-357504	Polyethylene bag, Set	1
		R-4774599	Instruction book	1
		R-4773695	Guarantee card	1
			Polyethylene bag, 240x320 Instruction book, Guarantee card	1
		R-4774720	Caution label, Fuse	1
			Polyethylene bag, Fuse	1
		R-4172785	Styro-foam cushion	2
		R-4075216	Individual carton	1
ACCESSORY PARTS				
		R-S37040-3	Cord assembly	2
CABINET APPEARANCE PARTS				
1		R-277724	Panel, Silver, Base	1
1		R-277724-L	Panel, Black, Base	1
			Screw, Pan Hd., 2x6, S-tight	7
			Screw, Flat Hd., 3x10, B-tight, Silver, Panel ~ Chassis	1
			Screw, Flat Hd., 3x10, B-tight, Black, Panel ~ Chassis	
2		R-A75507	Panel assembly, Silver	1
2		R-A75507-L	Panel assembly, Black	
3		R-3973937	Fix plastic board, Silver, Panel left side	1
3		R-3973937-L	Fix plastic board, Black, Panel left side	
4		R-3973938	Fix plastic board, Silver, Panel right side	1
4		R-3973938-L	Fix plastic board, Black, Panel right side	
			Screw, Bind Hd., 2.6x6, B-tight	4
			External tooth lock washer, Metal, 3	4
			Screw Oval Hd., 3x8, B-tight, Fix plastic board ~ Metal bracket	2
5		R-1272504-L	Top cover, Silver	1
5		R-1272504-M	Top cover, Black	
			Screw, Bind Hd., 4x6, Silver	4
			Screw, Bind Hd., 4x6, Black	
6		R-3973920	Knob, Silver, Power	1
6		R-3973920-L	Knob, Black, Power	
7		R-3973824-L	Knob, Silver, Eject	1
7		R-3973824-M	Knob, Black, Eject	
8		R-3973827-L	Knob, Silver, Counter	1
8		R-3973827-M	Knob, Black, Counter	
9		R-3973822	Knob, Silver, Push switch	10
9		R-3973822-L	Knob, Black, Push switch	
10		R-3973953	Knob, Silver, Slide volume	4
10		R-3973953-L	Knob, Black, Slide volume	
11		R-3974001	Spacer	4
12		R-3973954	Knob, Silver, Slide switch	2
12		R-3973954-L	Knob, Black, Slide switch	
13		R-3973781	Fix plastic board, Silver, Cassette lid	1
13		R-3973781-L	Fix plastic board, Black, Cassette lid	
14		R-3870177	Cassette lid	1
			Screw, Flat Hd., 2.6x8, B-tight	2
15		R-277726	Decoration metal, Silver, Cassette lid	1
15		R-277726-L	Decoration metal, Black, Cassette lid	
			Screw, Bind Hd., 2.6x8, B-tight, Silver	2
			Screw, Bind Hd., 2.6x8, B-tight, Black	
16		R-A75508	Chassis assembly, Silver, Front	1
16		R-A75508-L	Chassis assembly, Black, Front	
17		R-A75509	Chassis assembly, Rear	1
			Screw Bind Hd., 3x6, B-tight, Rear chassis	6
18		R-377070	Bushing, AC cord	1
19		R-1272506A	Bottom cover	1
			Screw, Bind Hd., 3x8, B-tight	8
20		R-S872150	Foot base assembly	4
			Screw, Flat Hd., 3x10, B-tight	4
CHASSIS MECHANICAL PARTS				
21		R-A75510	Metal bracket assembly, Front chassis	1
			Screw, Bind Hd., 3x8, B-tight Chassis ~ Metal bracket ~ Panel	6
			Screw, Flat Hd., 3x6, B-tight, Metal bracket ~ Cassette mechanism	2
22		R-1272810	Lever, Eject	1
23		R-3973763	Fix plastic board, Slide switch	3
24		R-2672591	Lever, Slide switch	1
25		R-2672741	Lever, Slide switch	2
			Screw, Pan Hd., 2.6x6, B-tight, Slide switch	3
26		R-3973962	Fix plastic board, Key switch	6
27		R-1272508A	Metal bracket, Front chassis ~ Rear chassis	2
28		R-1272818	Metal bracket, center, Front chassis ~ Rear chassis	1
			Tap. Screw, Oval Hd., 2.3x30 Chassis ~ Metal bracket	6
29		R-1272510	Metal bracket, Cassette mechanism	1
			Screw, Flat Hd., 3x8, B-tight	4
			Screw, Bind Hd., 3x6, B-tight Cassette mechanism mtg.	2
30		R-3973957	Lever, Power, Push switch	5
31		R-1272808	Metal bracket, Power	1
			Screw, Bind Hd., 3x6, B-tight	2
32		R-377060	Holder, Connector P. C. B. mtg.	2
33		R-1272809	Metal bracket, Amp P.C.B. push switch	1
			Screw, Oval Hd., 3x6	2
34		R-127591B	Shield case, Amp P. C. B.	1
35		R-S872225	Metal bracket assembly solenoid mtg	1
			Screw, Pan Hd., with washer, 3x8, B-tight	3
			E-ring, Metal, 2.5	1
36		R-237186	Metal bracket, Solenoid	1
			Screw, Bind Hd., 3x6, B-tight	1
37		R-1272561	Metal bracket, DIN socket ~ Rear chassis	1
			Screw, Bind Hd., 3x6, B-tight	1
38		R-1272820	Metal bracket, Terminal board ~ Rear chassis	1
			Screw, Bind Hd., 3x6, B-tight	1
CHASSIS ELECTRICAL PARTS				
		R-S37089-1	AC cord	1
39		R-W77979	Power transformer	1
			Screw, Pan Hd., With spring washer, 4x10	2
			Flat washer, metal, 4x16x1	2
			Nut, with washer M4	2
40		R-1272589	Shield case, Power transformer	1
41		R-S47655	Push switch, Power	1
			Screw Oval Hd., 3x6	2
42		R-S17300a	DC solenoid	1
			Screw, Pan Hd., 3x6	4
			External tooth lock washer, Metal M3	4
43		R-257187	Arm, Solenoid	1
44		R-137119	Spring pin, Arm Solenoid	1
		R-377032	Nylon band	10

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PARTS LIST

Key No.	Ref. No.	Part No.	Description	Q'ty
		R-S17190	Cord clip	8
			Screw, Bind Hd., with washer, 3x6, B-tight	8
45		R-S27426	AC outlet	1
46		R-4172960	Printed circuit board, Reed switch	1
47		R-S17038	Reed switch	1
48		R-4172961-5	Printed circuit board, IND	1
	CS3, 4, 15, 16	R-S27298-2	Housing, 2P	4
	CS1, 2, 5, 6, 13, 18	R-S27298-3	Housing, 3P	6
	CS17	R-S27298-4	Housing, 4P	1
	CS10, 11, 14	R-S27298-5	Housing, 5P	3
	CS12	R-S27298-7	Housing, 7P	1
	CS9	R-S27298-9	Housing, 9P	1
	CS7	R-S27298-10	Housing, 10P	1
	CS8	R-S27298-12	Housing, 12P	1
		R-247755	Terminal, Housing	83
	SEMICONDUCTORS			
	D106, 107, 108		Diode, SCP251D, LED P. C. B.	3
	D506		Diode, SLP151D, IND P. C. B.	1
	D105		Diode, SLP151D, LED P. C. B.	1
	D116, 316		Diode, SLP152B-03, LED P. C. B.	2
	D117, 317		Diode, SLP252B-02, LED P. C. B.	2
	D118, 318		Diode, SLP252B, LED P. C. B.	2
			Screw, Oval Hd., 3x6, B-tight Reed switch P. C. B. mtg.	2
			Screw, Bind Hd., 3x8, B-tight IND, P. C. B. mtg.	1
			Screw, Oval Hd., 3x10, B-tight LED, P. C. B. mtg.	4
			Screw, Bind Hd., 3x8, B-tight Volume and Switch P. C. B. mtg.	5
			Screw, Pan Hd., with washer, 3x8, B-tight Heat sink mtg. Logic, Amp P. C. B. mtg.	12
	POWER SUPPLY P. C. B. ASSEMBLY			
49		R-A75511	Circuit board assembly, Power supply	1
		R-S17024	Fuse holder	6
	F4	R-S17191	Fuse, T800 mA	1
	F7	R-S17286	Fuse, T3.15A	1
	F6	R-S17252	Fuse, T1.6A	1
	CP4	R-S27207-2	Plug, 2P	1
	CP5	R-S27207-3	Plug, 3P	1
50		R-A75512	Heat sink assembly	1
		R-2672582	Heat sink	(1)
			Mylar sheet, IS313B	(2)
			Bush, D	(2)
			Screw, Pan Hd., 3x8	(2)
			Nut, Hex Hd., 3	(2)
	Q501, 503		Transistor, 2SD313	(2)
	SEMICONDUCTORS			
	Q502, 504		Transistor, 2SC536	2
	D501, 502, 503		Diode, RB151	3
	D504		Diode, EQA-01-21	1
	D505		Diode, EQA-01-13	1
	RESISTORS			
	R504		Carbon, 820 ohm, ±5%, ¼ W	1
	R502		Carbon, 1 k ohm, ±5%, ¼ W	1
	R507		Carbon, 1.8 k ohm, ±5%, ¼ W	1
	R505		Metal oxide film, 27 ohm, ±10%, 3W	1
	R506		Cement, 82 ohm, ±10%, 5W	1
	R501		Fuse, 3.3 ohm, ±10%, ½ W	1
	R503		Fuse, 2.2 ohm, ±10%, ½ W	1

Key No.	Ref. No.	Part No.	Description	Q'ty
	CAPACITORS			
	C501, 502, 503		Mylar, 0.047μF, ±20%, 100V	3
	C504		Electrolytic, 1000μF/50V	1
	C511		Electrolytic, 3300μF/25V	1
	C507, 510, 512		Electrolytic, 2200μF/25V	3
	C506		Electrolytic, 220μF/25V	1
	C508		Electrolytic, 470μF/16V	1
	C509		Electrolytic, 220μF/16V	1
	C505		Electrolytic, 10μF/25V	1
	CONNECTOR P. C. B. ASSEMBLY			
51		R-A75513	Circuit board assembly, Connector	1
		R-S17024	Fuse holder	6
		R-237188	Eyelet lug	9
	F3	R-S17028	Fuse, T400mA	1
	F1	R-S17189	Fuse, T1.0A	1
	F2	R-S17191	Fuse, T800mA	1
	CAPACITORS			
	C515, 516		Metalized polyester film, 0.01μF, 250V, ECQ-EC	2
	AMP P. C. B. ASSEMBLY			
52		R-A75514	Circuit board assembly, Amp	1
53		R-S47473	Slide switch	1
54		R-S47658	Push switch	1
		R-237093	Eyelet lug	9
96		R-S17449	Terminal board	1
	CP3, 16, 15	R-S27207-2	Plug, 2P	3
	CP2, 13	R-S27207-3	Plug, 3P	2
	CP17	R-S27207-4	Plug, 4P	1
	CP11, 14, 10	R-S27207-5	Plug, 5P	3
	CP12	R-S27207-7	Plug, 7P	1
	F101, 301	R-S17448	Filter	2
		R-W87039	OSC coil	1
	F102, 302	R-W17022	Coil	2
	L101, 102, 103, 104 301, 302, 303, 304	R-W6724	Coil	8
	SVR101, 301, 102, 302	R-R110724	Preset resistor 10k	4
	SVR105, 305	R-R110723	Preset resistor 100k	2
	SVR303, 304, 103, 104, 107	R-R110735	Preset resistor 20k	5
	SVR106	R-R110737	Preset resistor 500 ohm	1
	SEMICONDUCTORS			
	IC101		Integrated circuit, LA3160	1
	IC102, 302		Integrated circuit, LM1011	2
	IC104		Integrated circuit, LM324	1
	Q115, 116		Transistor, 2SD545	2
	Q109, 309		Transistor, 2SD545	2
	Q101, 301		Transistor, 2SC1571	2
	Q103, 303		Transistor, 2SC536	2
	Q304, 305, 306, 307, 308, 310, 104, 105, 106, 107, 108, 110, 111, 112, 113		Transistor, 2SC536	15
	Q302, 317, 318, 319, 320, 321, 102, 117, 118, 119, 120, 121		Transistor, 2SC536	12
	Q114		Transistor, 2SD313	1
	Q111, 112, 114, 311, 312, 314		Diode, 1S188AM	6
	D101, 102, 103, 104, 115, 315		Diode, DS442	6
	D113, 313		Zener diode, WZ058	2
	RESISTORS			
	R215		Carbon, 1 ohm, ±5%, ¼ W	1
	R111, 311		Carbon, 10 ohm, ±5%, ¼ W	2
	R145, 345		Carbon, 56 ohm, ±5%, ¼ W	2
	R315, 115, 176, 376		Carbon, 120 ohm, ±5%, ¼ W	4
	R141, 341		Carbon, 150 ohm, ±5%, ¼ W	2

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PARTS LIST

Key No.	Ref. No.	Part No.	Description	Qty
	R149, 349		Carbon, 100 ohm, ±5%, 1/4 W	2
	R153, 353		Carbon, 47 ohm, ±5%, 1/4 W	2
	R126, 326		Carbon, 180 ohm, ±5%, 1/4 W	2
	R369, 169, 211		Carbon, 220 ohm, ±5%, 1/4 W	3
	R175, 375		Carbon, 390 ohm, ±5%, 1/4 W	2
	R177, 377, 199, 200, 195		Carbon, 560 ohm, ±5%, 1/4 W	5
	R418, 218		Carbon, 820 ohm, ±5%, 1/4 W	2
	R110, 165, 365, 198, 196, 183, 189, 389, 383		Carbon, 1 k ohm, ±5%, 1/4 W	9
	R163, 363		Carbon, 1.2 k ohm, ±5%, 1/4 W	2
	R173, 373		Carbon, 2.2 k ohm, ±5%, 1/4 W	2
	R117, 317, 154, 354		Carbon, 2.7 k ohm, ±5%, 1/4 W	4
	R172, 372, 114, 314, 138, 338		Carbon, 3.9 k ohm, ±5%, 1/4 W	6
	R164, 364, 122, 322, 148, 348, 155, 355, 190, 390		Carbon, 4.7 k ohm, ±5%, 1/4 W	10
	R340, 140, 108, 134, 135, 150, 334, 335, 350		Carbon, 5.6 k ohm, ±5%, 1/4 W	9
	R142, 342		Carbon, 8.2 k ohm, ±5%, 1/4 W	2
	R417, 333, 181, 320, 120, 101, 105, 217, 113, 133, 313, 381, 166, 366		Carbon, 10 k ohm, ±5%, 1/4 W	14
	R121, 321, 339, 139		Carbon, 12 k ohm, ±5%, 1/4 W	4
	R358, 158, 359, 159, 157, 357, 160, 151, 351, 107, 191, 192, 193, 194, 188, 219, 388, 419, 360		Carbon, 15 k ohm, ±5%, 1/4 W	19
	R323, 123, 179, 379		Carbon, 18 k ohm, ±5%, 1/4 W	4
	R197, 180, 380, 184, 185, 187, 384, 385, 387, 146, 346		Carbon, 22 k ohm, ±5%, 1/4 W	11
	R161, 174, 374, 361		Car on, 27 k ohm, ±5%, 1/4 W	4
	R186, 386		Carbon, 39 k ohm, ±5%, 1/4 W	2
	R128, 328		Carbon, 47 k ohm, ±5%, 1/4 W	2
	R332, 132, 216, 178, 378		Carbon, 56 k ohm, ±5%, 1/4 W	5
	R167, 367, 182, 382, 336, 136		Carbon, 68 k ohm, ±5%, 1/4 W	6
	R170, 370		Carbon, 82 k ohm, ±5%, 1/4 W	2
	R324, 124, 171, 106, 116, 316, 371		Carbon, 100 k ohm, ±5%, 1/4 W	7
	R162, 362		Carbon, 150 k ohm, ±5%, 1/4 W	2
	R337, 137		Carbon, 220 k ohm, ±5%, 1/4 W	2
	R319, 119, 118, 318, 331, 330, 112, 130, 131, 312		Carbon, 270 k ohm, ±5%, 1/4 W	10
	R329, 129		Carbon, 560 k ohm, ±5%, 1/4 W	2
	R125, 325		Carbon, 1 M, ±5%, 1/4 W	2
	R213		Carbon, 5.6 ohm, ±5%, 1/4 W	1
	R214		Carbon, 12 k ohm, ±5%, 1/4 W	1
	R212		Carbon, 10 ohm, ±5%, 1/4 W	1
	R127, 327		Metal film, 3.3 k ohm, ±1%, 1/4 W	2
	R109, 104		Solid, 220 ohm, ±10%, 1/2 W	2
	R201, 202		Solid, 100 ohm, ±10%, 1/2 W	2
	R168, 368		Solid, 390 ohm, ±10%, 1/2 W	2
	R103		Solid, 470 ohm, ±10%, 1/2 W	1
	R102		Fuse, 33 ohm, ±10%, 1/2 W	1
	CAPACITORS			
			Ceramic, 10 PF, ±10%, 25V	2
	C314, 114		Ceramic, 20 PF, ±10%, 25V	2
	C159, 359, 162, 362		Ceramic, 56 PF, ±10%, 25V	4
	C166, 366		Ceramic, 100 PF, ±10%, 25V	2
	C313, 113, 121, 321		Ceramic, 470 PF, ±10%, 25V	4
	C140, 340		Ceramic, 680 PF, ±10%, 25V	2
	C185, 186		Ceramic, 220 PF, ±10%, 50V	2
	C124, 324		Ceramic, 47 PF, ±10%, 50V	2
	C337, 332, 132, 137		Ceramic, 1000 PF, ±10%, 50V	4
	C183, 182		Mylar, 0.0033μF, ±5%, 50V	2
	C184, 157, 357		Mylar, 0.01μF, ±5%, 50V	3
	C335, 135		Mylar, 0.0047μF, ±5%, 50V	2
	C333, 133		Mylar, 0.0056μF, ±5%, 50V	2
	C334, 134		Mylar, 0.027μF, ±5%, 50V	2
	C329, 129		Mylar, 0.047μF, ±5%, 50V	2
	C149, 349		Mylar, 0.0091μF, ±5%, 50V	2
	C346, 350, 354, 146, 150, 154, 142, 342		Mylar, 0.0082μF, ±5%, 50V	8
	C152, 352, 117, 317		Mylar, 0.012μF, ±5%, 50V	4
	C318, 118		Mylar, 0.015μF, ±5%, 50V	2
	C149, 349		Mylar, 0.018μF, ±5%, 50V	2
	C153, 353		Mylar, 0.0039μF, ±5%, 50V	2
	C156, 356		Mylar, 0.018μF, ±5%, 50V	2
	C111, 311		Styrol, 560 PF, ±5%, 50V	2
	C103		Electrolytic, 330μF/25V	1
	C107		Electrolytic, 220μF/25V	1

Key No.	Ref. No.	Part No.	Description	Qty
	C102, 105, 106, 181		Electrolytic, 100μF/25V	4
	C104, 109		Electrolytic, 47μF/25V	2
	C101, 180, 122, 141, 143, 147, 151, 155, 163, 164, 167, 171, 322, 341, 343, 347, 351, 355, 363, 364, 367, 371		Electrolytic, 10μF/25V	22
	C108, 125, 325		Electrolytic, 220μF/16V	3
	C174, 175, 176, 177, 119, 319		Electrolytic, 4.7μF/6.3V	6
	C138, 338		Electrolytic, 0.47μF/50V	2
	C112, 312, 158, 165, 358, 365		Electrolytic, 3.3μF/25V	6
	C120, 320		Electrolytic, 2.2μF/25V	2
	C123, 139, 161, 323, 339, 361		Electrolytic, 1μF/16V	6
	C126, 326		Electrolytic, 0.1μF/16V	2
	C127, 327		Electrolytic, 0.33μF/16V	2
	C169, 369		Electrolytic, 1μF/25V	2
	C172, 173, 372, 373		Electrolytic, 4.7μF/25V	4
	C115, 128, 130, 131, 136, 160, 170, 178, 168, 315, 328, 330, 331, 336, 360, 370, 378, 368		Electrolytic, 10μF/16V	18
	C116, 316		Electrolytic, 220μF/6.3V	2
	C301		Electrolytic, 100μF/6.3V	1
	C187		Polypropylen, 8200PF, ±5%, 100V	1
	MIC P. C. B. ASSEMBLY			
55		R-A75515	Circuit board assembly, Mic	1
56		R-S27439	Mic jack	1
	CP18	R-S27260-3	Plug, 3P	1
	SEMICONDUCTORS			
	IC103		Integrated circuit, LA3122	1
	RESISTORS			
	R251, 451		Carbon, 220 k ohm, ±5%, 1/4 W	2
	R252, 452		Carbon, 47 k ohm, ±5%, 1/4 W	2
	R253, 453		Carbon, 56 k ohm, ±5%, 1/4 W	2
	R250, 450		Carbon, 10 k ohm, ±5%, 1/4 W	2
	CAPACITORS			
	C254, 454		Electrolytic, 10μF/25V	2
	C110		Electrolytic, 47μF/25V	1
	C252, 452		Electrolytic, 10μF/16V	2
	C253, 453		Electrolytic, 47μF/6.3V	2
	C250, 450		Electrolytic, 1μF/25V	2
	C255, 455		Ceramic, 47 PF, ±10%, 50V	2
	C251, 451		Ceramic, 470 PF, ±10%, 50V	2
	LED P. C. B. ASSEMBLY			
57	R-A75516		Circuit board assembly, LED	1
	SEMICONDUCTORS			
	IC105, 305, 106, 306		Integrated circuit, LB1416	4
	RESISTORS			
	R237, 437, 238, 438, 239, 439		Carbon, 100 ohm, ±5%, 1/4 W	6
	R241, 242, 243		Carbon, 820 ohm, ±5%, 1/4 W	3
	R240		Carbon, 1.8 k ohm, ±5%, 1/4 W	1
	R435, 235		Carbon, 3.9 k ohm, ±5%, 1/4 W	2
	R233, 433		Carbon, 10 k ohm, ±5%, 1/4 W	2
	R236, 436, 234, 434, 232, 432		Carbon, 22 k ohm, ±5%, 1/4 W	6
	R231, 431		Carbon, 56 k ohm, ±5%, 1/4 W	2
	CAPACITORS			
	C232, 432, 233, 433		Electrolytic, 10μF/25V	4
	C231, 431		Electrolytic 1μF/25V	2
	C234, 434		Ceramic, 1000 PF, ±10%, 50V	2
	VOLUME AND SWITCH P. C. B. ASSEMBLY			
58		R-A75517	Circuit board assembly, Volume and switch	1
59	S7A~F	R-S47616-2	Key switch	6
60	S8	R-S47628	Slide switch	1
61	S9, 10	R-S47629	Slide switch	2
62		R-R130729	Slide variable resistor	2

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PARTS LIST

Key No.	Ref. No.	Part No.	Description	Q'ty
63		R-R130728	Slide variable resistor	1
	HEADPHONE P. C. B. ASSEMBLY			
64		R-A75518	Circuit board assembly, Headphone	1
65		R-S27438	Headphone jack	1
	RESISTORS			
	R254, 454		Carbon, 8.2 ohm, ±5%, ¼ W	2
	LOGIC P. C. B. ASSEMBLY			
66		R-A75519	Circuit board assembly, Logic	1
67		R-S27332	DIN socket	1
	CP9	R-S27207-9	Plug, 9P	1
	CP1,6	R-S27207-3	Plug, 3P	2
	SEMICONDUCTORS			
	IC1		Integrated circuit, TC9121	1
	Q14		Transistor, 2SD313	1
	Q15, 19		Transistor, 2SD400	2
	Q8, 9, 10, 11		Transistor, 2SC1317	4
	Q6, 7		Transistor, 2SC719	2
	Q1, 3, 4, 5, 12, 13, 16, 17, 18		Transistor, 2SC536	9
	Q2		Transistor, 2SA608	1
	D2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 18, 19		Diode, DS442	16
	D20		Diode, 1S188AM	1
	D1		Diode, WZ-058	1
	D14, 17		Diode, SM-1	2
	RESISTORS			
	R42		Carbon, 100 ohm, ±5%, ¼ W	1
	R40		Carbon, 560 ohm, ±5%, ¼ W	1
	R31, 32, 7		Carbon, 1 k ohm, ±5%, ¼ W	3
	R20, 21, 25		Carbon, 1.8 k ohm, ±5%, ¼ W	3
	R17, 18, 22, 5		Carbon, 2.2 k ohm, ±5%, ¼ W	4
	R43		Carbon, 2.7 k ohm, ±5%, ¼ W	1
	R44, 3, 9		Carbon, 4.7 k ohm, ±5%, ¼ W	3
	R34, 35, 37		Carbon, 5.6 k ohm, ±5%, ¼ W	3
	R29		Carbon, 6.8 k ohm, ±5%, ¼ W	1
	R8		Carbon, 8.2 k ohm, ±5%, ¼ W	1
	R11, 12, 23, 36, 38, 39		Carbon, 10 k ohm, ±5%, ¼ W	6
	R41		Carbon, 22 k ohm, ±5%, ¼ W	1
	R13, 14, 15, 16, 26, 28, 33		Carbon, 33 k ohm, ±5%, ¼ W	7
	R2		Carbon, 56 k ohm, ±5%, ¼ W	1
	R10		Carbon, 82 k ohm, ±5%, ¼ W	1
	R45, 4		Carbon, 100 k ohm, ±5%, ¼ W	2
	R6		Carbon, 270 k ohm, ±5%, ¼ W	1
	R1		Solid, 180 ohm, ±10%, ½ W	1
	R27, 30		Solid, 470 ohm, ±10%, ½ W	2
	R46		Solid, 270 ohm, ±10%, ½ W	1
	R19, 24		Solid, 2.2 ohm, ±10%, ½ W	2
	CAPACITORS			
	C25		Ceramic, 220 PF, ±10%, 25V	1
	C16, 17, 18, 19, 20, 21, 22, 23		Ceramic, 0.001μF, ±10%, 25V	8
	C24		Ceramic, 0.047μF, ±10%, 50V	1
	C11		Mylar, 0.0056μF, ±5%, 50V	1
	C13		Electrolytic, 10μF/25V	1
	C10		Electrolytic, 2200μF/16V	1
	C7, 9		Electrolytic, 100μF/16V	2
	C3, 12		Electrolytic, 47μF/16V	2
	C6		Electrolytic, 33μF/16V	1
	C2		Electrolytic, 10μF/16V	1
	C1		Electrolytic, 47μF/10V	1
	C5		Electrolytic, 1μF/10V	1
	C15		Electrolytic, 220μF/6.3V	1
	C4, 14		Electrolytic, 100μF/6.3V	2
	C8		Electrolytic, 10μF/6.3V	1

Key No.	Ref. No.	Part No.	Description	Q'ty
	CASSETTE MECHANISM PARTS			
68		R-S97071-2B	Cassette mechanism assembly	1
69		R-A75520	Pulley assembly	1
			Screw, Oval Hd., 3x6, B-tight	2
70		R-3973135	Top cover, Soft eject	1
71		R-3973134	Bottom cover, Soft eject	1
			Screw, Pan Hd., 2.6x12, B-tight	2
72		R-3973136	Fin, Soft eject	1
73		R-3973133	Gear, Soft eject	1
74		R-1171547	Lever, Eject	1
75		R-1272514	Metal bracket, Eject switch	1
			Screw, Pan Hd., 2.6x4, B-tight	1
76		R-1570769	Coil spring, Eject lever	1
			E-ring, E3	1
77		R-S47466	Snap switch	1
			Screw, Pan Hd., 2x8	2
78		R-3973961	Gear, Soft eject	1
79		R-1570767A	Coil spring, Soft eject	1
			E-ring, E3	2
80		R-S872118	Metal bracket assembly, Cassette mechanism left side mtg.	1
			Screw, Flat Hd., 3x8, B-tight	2
81		R-S57217	Tape counter	1
			Screw, Flat Hd., 3x6	2
82		R-S872176	Metal bracket assembly, Tape counter	1
			Screw, Oval Hd., 3x6, B-tight	2
83		R-A75521	Cassette base assembly, Silver	1
83		R-A75521-L	Cassette base assembly, Black	1
			Thrust washer, 4.1φx6.5φx0.5t, cassette base	2
84		R-S872177	Cassette case assembly, Silver	1
84		R-S872177-L	Cassette case assembly, Black	1
85		R-3973695	Fix plastic board, Silver, Cassette case left side	1
85		R-3973695-L	Fix plastic board, Black, Cassette case left side	1
86		R-3973696	Fix plastic board, Silver, Cassette case right side	1
86		R-3973696-L	Fix plastic board, Black, Cassette case right side	1
87		R-137158	Spring metal, Cassette Case	2
			Screw, Pan Hd., 2x4	6
88		R-1171549	Metal bracket, Cassette mechanism right side	1
			Screw, Flat Hd., 3x8, B-tight	1
89		R-1171550	Lever, Cassette case~Metal bracket	1
90		R-147084A	Special screw, Lever mtg	1
91		R-1570770	Shaft, Cassette case left ~Cassette base left	1
			Screw, Pan Hd., 2.6x6	1
92		R-1570768	Shaft, Cassette case right ~Cassette base right	1
			Screw, Flat Hd., 2.6x8	1
93		R-1570771	Shaft, Cassette case left~Gear	1
			Screw, Pan Hd., 2.6x6	1
94		R-4470325	Belt, Pulley assembly~Counter	1
95		R-4470093	Belt, Pulley assembly ~Cassette mechanism	1
		R-4170360	Protector, Moldplane	1
		R-477904A	Label, Cassette lisence	1

NOTES: 1. Part orders must contain Model Number, Part Number and Description.
Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

PARTS LIST (CASSETTE MECHANISM)

Key No.	Ref. No.	Part No.	Description	Q'ty
R-S97071-2B				
1		1240 01 81A	Chassis assembly	1
2		1240 01 12	Cassette guide R	1
3		1240 01 13	Cassette guide L	1
4		1240 02 92	Take up reel assembly	1
5		1240 02 92	Supply reel assembly	1
6		1322 03 91	Brake arm assembly	1
7		1240 03 02	Brake arm spring	1
8		1240 04 91B3	Head panel assembly	1
9		1240 04 07	Guide roller A	2
10		1240 04 08	Guide roller B	1
11		1240 04 09	Guide coller	2
12		1240 05 92	Pinch roller arm assembly	1
13		1240 06 97A	Drive unit assembly	1
16		1322 07 01	Flywheel capstan	1
17		1322 07 71	Flywheel metal	1
18		1322 07 92	FL hold plate assembly	1
19		1327 08 91	Pull plunger coil assembly	1
20		1327 08 92	Pull plunger core assembly	1
21		1240 08 81	Pull arm assembly	1
22		1240 01 10	Pull arm shaft	1
23		1322 08 02	Pull arm nut	1
24		1240 08 93	Brake plunger coil assembly	1
25		1240 08 94	Brake plunger core assembly	1
26		1240 08 11	Brake plunger spring	1
27		1240 08 82	Lock arm assembly	1
29		1257 09 93	Main motor assembly	1
30		1322 10 92	P. C. B. assembly	1
33		1240 10 91	Panel lock plate assembly	1
34		1240 10 08	Lock plate coller	2
38		1240 09 05	Main belt	1
39		1240 02 08	B. T plate spring	1
40		1240 02 07	Felt	1
41		1240 02 06	B. T plate	1
50			Screw, Pan Hd., M2x4	1
51			Screw, Bind Hd., M2.3x4	2
52			Screw, Pan Hd., M2.3x4, with Spring Washer	5
53			Screw, Pan Hd., M2.3x6, with Spring Washer	3
54			Screw, Pan Hd., M2.3x8, Black	4
55			Screw, Pan Hd., M2.3x12, Black	2
56			Screw, Pan Hd., M2.6x5, with Spring Washer	3
57			Screw, Oval Hd., M2.6x5	3
58			Screw, Pan Hd., M3x4	2
59			Screw, Flat Hd., M3x3.5	2
60			E ring, ϕ1.2	2
61			E ring, ϕ1.5	2
62			E ring, ϕ2.0	1
63			E ring, ϕ2.5	2
64		1240 08 12	Nylon washer, ϕ10xϕ15x10.5	1
65		1322 07 06	Nylon washer, ϕ3xϕ5x10.5	1
66		1322 07 05	Nylon washer, ϕ3xϕ8x10.5	1
		H57102-12	R/P head	1
		R-S07306-1	Erasing head	1

NOTES : 1. Part orders must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and/or

EXPLODED VIEW (CASSETTE MECHANISM)